THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A compressor system for gas which normally operates on a gas compression cycle but which also operates in a drier regeneration cycle, said system comprising:

1) a compressor driven by a motor, the compressor having at least a first stage inlet through which passes a flow of gas being compressed from a gas supply inlet:

2) a gas delivery outlet at the outlet of the compressor, for supplying gas to a delivery line;

3) a gas drier stage comprising a desiccant bed located in-line with the flow of gas passing through the compressor during the gas compression cycle;

4) a condenser also located in-line with the flow of gas passing through the compressor during the gas compression cycle which condenser, during the compression cycle, is normally inactive;

5) temperature control means to control the temperatures of the desiccant bed and condenser which means are, during the compression cycle, inactive but, upon entering into a regeneration cycle, such means being actuatable to cause the desiccant bed to be heated and the condenser to be cooled; and

6) valve means for switching the flow of gas from the delivery outlet to recirculate through the compressor,

whereby, during the regeneration cycle arising from activation of the valve means, gas trapped within the compressor, desiccant bed and condenser is redirected from the outlet of the compressor for circulation in a closed

loop as a recirculating gas flow through the compressor, with at least

a portion of such recirculating gas flow passing through the dessicant bed and condenser to permit water evolved from the desiccant bed to be carried by the recirculating gas to the condenser where it condenses due to the low temperature condition maintained within the condenser by the temperature control means.

2. A compressor system as in claim 1 wherein the compressor is a multi-stage compressor having at least first and second stages, and the desiccant bed and condenser are positioned in-line between consecutive, preferably the first and second stages of the compressor.

3. A compressor system as in claim 2 wherein the condenser produces water as a condensate and further comprising a semi-permeable membrane through which condensed water is allowed to evaporate into the environment.

4. A compressor system as in claim 3 wherein the membrane is in form of tubing filled by gravity.

5. A compressor system as in claim 1 wherein the compressor comprises a sealed metal casing with an interior volume connected to said gas supply inlet and to the first stage compressor inlet, said interior volume further comprising

1) said motor contained therein and connected to drive said compressor, and

2) a supply valve at said gas supply inlet that closes when the valve means switches the flow of gas to recirculate through the compressor and opens when compressed gas is passing to the delivery line,

whereby, in accordance with the state of activation of the valve means, gas within the interior volume of the casing may be drawn-in by the first stage compressor from either said gas supply inlet or from said compressor outlet.

6. A compressor system as in claim 5 comprising a main logic controller connected to motor control circuitry to effect variable speed operation of the motor for operating the motor and compressor at a reduced speed, said speed being adjusted during regeneration so that the flow of recirculating gas passing through the condenser is limited, permitting such gas flow to be chilled when it exits the condenser whereby the transfer of moisture from the desiccant bed to the condenser is effected.

7. A compressor system as in claim 6 wherein the motor is an alternating current induction motor, and the motor control circuitry produces an alternating current signal of varying frequency, whereby the speed of the motor is varied in accordance with such varying frequency

8. A compressor system as in claim 5 comprising a main logic controller connected to a bypass valve on a bypass line that diverts recirculating gas from passing through said dessicant bed and condenser so that, during regeneration, the flow of recirculating gas passing through the condenser is limited, permitting such gas flow to be

chilled when it exits the condenser whereby the transfer of moisture from the desiccant bed to the condenser is effected.

9. A compressor system as in claim 5 comprising motor control circuitry located within the casing for delivering of current to the motor, said motor control circuitry being connected to said motor through wiring that is shielded by said casing whereby electromagnetic emissions arising from current being delivered from the motor controller to the motor are not transmitted outside the metal casing.

10. A compressor system for gas comprising:

1) a compressor having at least a first stage inlet for receiving a flow of gas from a gas supply inlet to be compressed;

2) a motor connected to drive said compressor;

3) a gas delivery outlet at the outlet of the compressor, for supplying gas to a delivery line;

4) a sealed metal casing enclosing the motor, and

5) motor control circuitry located within the casing for delivering of current to the motor, said motor control circuitry being connected to said motor through wiring that is shielded by said casing,

whereby electromagnetic emissions arising from current being delivered from the motor controller to the motor are not transmitted outside the metal casing.

11. A compressor system as in claim 10 wherein said sealed metal casing defines an interior volume connected to said gas supply inlet and to the first stage compressor inlet

line that diverts recirculating gas from passing through said dessicant bed and condenser so that, during regeneration, the flow of recirculating gas passing through the condenser is limited, permitting such gas flow to be chilled when it exits the condenser whereby the transfer of moisture from the desiccant bed to the condenser is effected.

9. A compressor system as in claim 5 comprising motor control circuitry located within the casing for delivering of current to the motor, said motor control circuitry being connected to said motor through wiring that is shielded by said casing whereby electromagnetic emissions arising from current being delivered from the motor controller to the motor are not transmitted outside the metal casing.

10. A compressor system for gas comprising:

1) a compressor having at least a first stage inlet for receiving a flow of gas from a gas supply inlet to be compressed;

2) a variable speed, alternating current induction motor connected to drive said compressor;

3) a gas delivery outlet at the outlet of the compressor, for supplying gas to a delivery line;

4) a sealed metal casing enclosing the motor, and

5) motor control circuitry located within the casing for delivering of current to the motor, said motor control circuitry providing an alternating current of varying frequency to vary the speed of said motor and being

connected to said motor through wiring that is shielded by said casing,
whereby electromagnetic emissions arising from current being delivered from the motor controller to the motor are not transmitted outside the metal casing.

11. A compressor system as in claim 10 wherein said interior volume is connected to said gas supply inlet and to the first stage compressor inlet permitting the compressor to draw gas from the interior volume.

12. A compressor system as in claim 10 wherein the motor control circuitry operates to create an alternating current having multiple harmonics.